

Mid Snake River/Succor Creek Subbasin Assessment and Total Maximum Daily Load



April 2003

Mid Snake River/Succor Creek Subbasin Assessment and TMDL

April 2003

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Abbreviations, Acronyms, and Symbols

7Q2	The lowest flow that occurs in seven consecutive days within a two year period	DEQ	Department of Environmental Quality
§303(d)	Refers to section 303 subsection (d) of the Clean Water Act, or a list of impaired water bodies required by this section	DO	dissolved oxygen
§	Section (usually a section of federal or state rules or statutes)	DWS	domestic water supply
AWS	agricultural water supply	EPA	United States Environmental Protection Agency
BAG	Basin Advisory Group	F	Fahrenheit
BLM	United States Bureau of Land Management	FWS	U.S. Fish and Wildlife Service
BMP	best management practice	GIS	Geographical Information Systems
BOD	biological oxygen demand	HUC	Hydrologic Unit Code
BOR	United States Bureau of Reclamation	IDAPA	Refers to citations of Idaho administrative rules
BURP	Beneficial Use Reconnaissance Program	IDFG	Idaho Department of Fish and Game
C	Celsius	IDL	Idaho Department of Lands
CFR	Code of Federal Regulations (refers to citations in the federal administrative rules)	IDWR	Idaho Department of Water Resources
cfs	cubic feet per second	IRU	Idaho Rivers United
CWA	Clean Water Act	km	kilometer
CWAL	cold water aquatic life	km²	square kilometer
		LA	load allocation
		LC	load capacity
		m	meter

mi	mile	SAWQP	state agricultural water quality project
mi²	square miles	SBA	subbasin assessment
mg/L	milligrams per liter	SCR	secondary contact recreation
MOS	margin of safety	SFI	DEQ's stream fish index
MWMT	maximum weekly maximum temperature	SHI	DEQ's stream habitat index
n.a.	not applicable	SMI	DEQ's stream macroinvertebrate index
NA	not assessed	SRP	soluble reactive phosphorus
NB	natural background	SS	salmonid spawning
nd	no data (data not available)	SSC	suspended sediment concentration
NFS	not fully supporting	SSOC	stream segment of concern
NPDES	National Pollutant Discharge Elimination System	TDG	total dissolved gases
NRCS	Natural Resources Conservation Service	TDS	total dissolved solids
NTU	nephelometric turbidity unit	TIN	total inorganic nitrogen
ORW	Outstanding Resource Water	TKN	total Kjeldahl nitrogen
PCR	primary contact recreation	TMDL	total maximum daily load
QA	quality assurance	TP	total phosphorus
QC	quality control	TS	total solids
RFI	DEQ's river fish index	TSS	total suspended solids
RMI	DEQ's river macroinvertebrate index	t/y	tons per year
RPI	DEQ's river physiochemical index	U.S.	United States
		USDA	United States Department of Agriculture

USFS	United States Forest Service
USGS	United States Geological Survey
WAG	Watershed Advisory Group
WBAG	Water Body Assessment Guidance
WBID	water body identification number
WET	whole effluence toxicity
WLA	wasteload allocation
WQLS	water quality limited segment
WQS	water quality standard

Executive Summary

The federal Clean Water Act (CWA) requires that states and tribes restore and maintain the chemical, physical, and biological integrity of the nation's waters (33 USC § 1251.101). States and tribes, pursuant to section 303 of the CWA are to adopt water quality standards necessary to protect fish, shellfish, and wildlife while providing for recreation in and on the waters whenever possible. Section 303(d) of the CWA establishes requirements for states and tribes to identify and prioritize water bodies that are water quality limited (i.e., water bodies that do not meet water quality standards). States and tribes must periodically publish a priority list of impaired waters, currently every two years. For waters identified on this list, states and tribes must develop a total maximum daily load (TMDL) for the pollutants, set at a level to achieve water quality standards. This document addresses the water bodies in the Mid Snake River/Succor Creek Subbasin that have been placed on what is known as the "§303(d) list."

This subbasin assessment and TMDL analysis has been developed to comply with Idaho's TMDL schedule. This assessment describes the physical, biological, and cultural setting; water quality status; pollutant sources; and recent pollution control actions in the Mid Snake River/Succor Creek Subbasin located in southwest Idaho. The first part of this document, the subbasin assessment, is an important first step in leading to the TMDL. The starting point for this assessment was Idaho's current §303(d) list of water quality limited water bodies. Twenty-one segments of the Mid Snake River/Succor Creek Subbasin were included on this list. The subbasin assessment portion of this document examines the current status of §303(d) listed waters, and defines the extent of impairment and causes of water quality limitation throughout the subbasin. The loading analysis quantifies pollutant sources and allocates responsibility for load reductions needed to return listed waters to a condition of meeting water quality standards.

The Mid Snake River/Succor Creek Watershed Advisory Group (WAG) and the designated agencies played a significant role in the TMDL development process. The WAG and the designated agencies were involved in developing the allocation processes and their continued participation will be critical while implementing the TMDL.

Subbasin at a Glance

Table A and Figure A show the §303(d) listed water bodies within the basin and the Mid Snake River/Succor Creek watershed boundaries.

Table A. 303(d)¹ Listed Segments in the Mid Snake River/Succor Creek Subbasin.

Water Body	Boundaries	WQLS & AU³	303(d) Pollutants
Snake River	CJ Strike Reservoir (below dam) to Castle Creek	WQLS: 2670 AU: 006_07	Sediment
Snake River	Castle Creek to Swan Falls	WQLS: 2669 AU: 006_07	Sediment
Snake River	Swan Falls to Boise River	WQLS: 2668 AU: 006_07, 001_07	Bacteria, dissolved oxygen, flow alteration, nutrients, pH, sediment
Birch Creek	HW to Snake River	WQLS: 2684 AU: 021_02, 03, 04	Sediment
Brown Creek	HW to Catherine Creek	WQLS: 2682 AU: 019_02, 03, 04	Sediment, temperature
Castle Creek	T5SR1ES28 to Snake River	WQLS: 2680 AU: 014_03, 04, 05	Temperature, sediment, flow alteration
Corder Creek	HW to Snake River	WQLS: 2685 AU: 025_02	Sediment
Cottonwood Creek	HW to Succor Creek	WQLS: none AU: 003_02	Temperature
Hardtrigger Creek	HW to Snake River	WQLS: 2675 AU: 008_02	Sediment
Jump Creek	Headwaters to Snake River	WQLS: 2673 AU: 005_02,03	Habitat alteration
McBride Creek	Headwaters to Oregon Line	WQLS: 2672 AU: 004_02,03	Flow alteration, sediment, temperature
North Fork Castle Creek	HW to Castle Creek	WQLS: 2680 AU: 014_02a	Temperature
Pickett Creek	T5SR1WS32 to Catherine Creek	WQLS: 2681 AU: 016_02, 03	Sediment
Pickett Creek	Headwaters to T5SR1WS32	WQLS: 6681 AU: 016_02	Flow alteration, sediment, temperature
Poison Creek ²	Headwaters to Shoofly Creek	WQLS: 2687 AU: 006_02, 03	Sediment
Rabbit Creek	HW to Snake River	WQLS: 2677 AU: 026_02	Sediment
Reynolds Creek	Diversion to Snake River	WQLS: 2676 AU: 009_04	Sediment

Sinker Creek	Diamond Creek to Snake River	WQLS: 2679 AU: 006_03	Flow alteration, sediment, temperature
South Fork Castle Creek	HW to Castle Creek	WQLS: 2683 AU: 014_02	Bacteria
Squaw Creek	HW to Snake River	WQLS: 2674 AU: 007_02, 03	Temperature
Squaw Creek	Unnamed tributary 3.9 km upstream to Snake River	WQLS: 2674 AU: 007_03	Sediment
Succor Creek	Oregon line to Snake River	WQLS: 2671 AU: 002_04	Sediment
Succor Creek	HW to Oregon line	WQLS: 6671 AU: 002_02, 03	Flow alteration, sediment, temperature

¹Refers to a list created by the State of Idaho (using monitoring data) in 1998 of water bodies in Idaho that did not fully support at least one beneficial use. This list is required under section 303 subsection "d" of the Clean Water Act.

²Poison Creek appears on the 303(d) list under HUC 17050103. This is a mistake. The Poison Creek that is in HUC 17050103 is not 303(d) listed. However, Poison Creek is evaluated as part of this subbasin assessment

³Water Quality Limited Segment & Assessment Unit

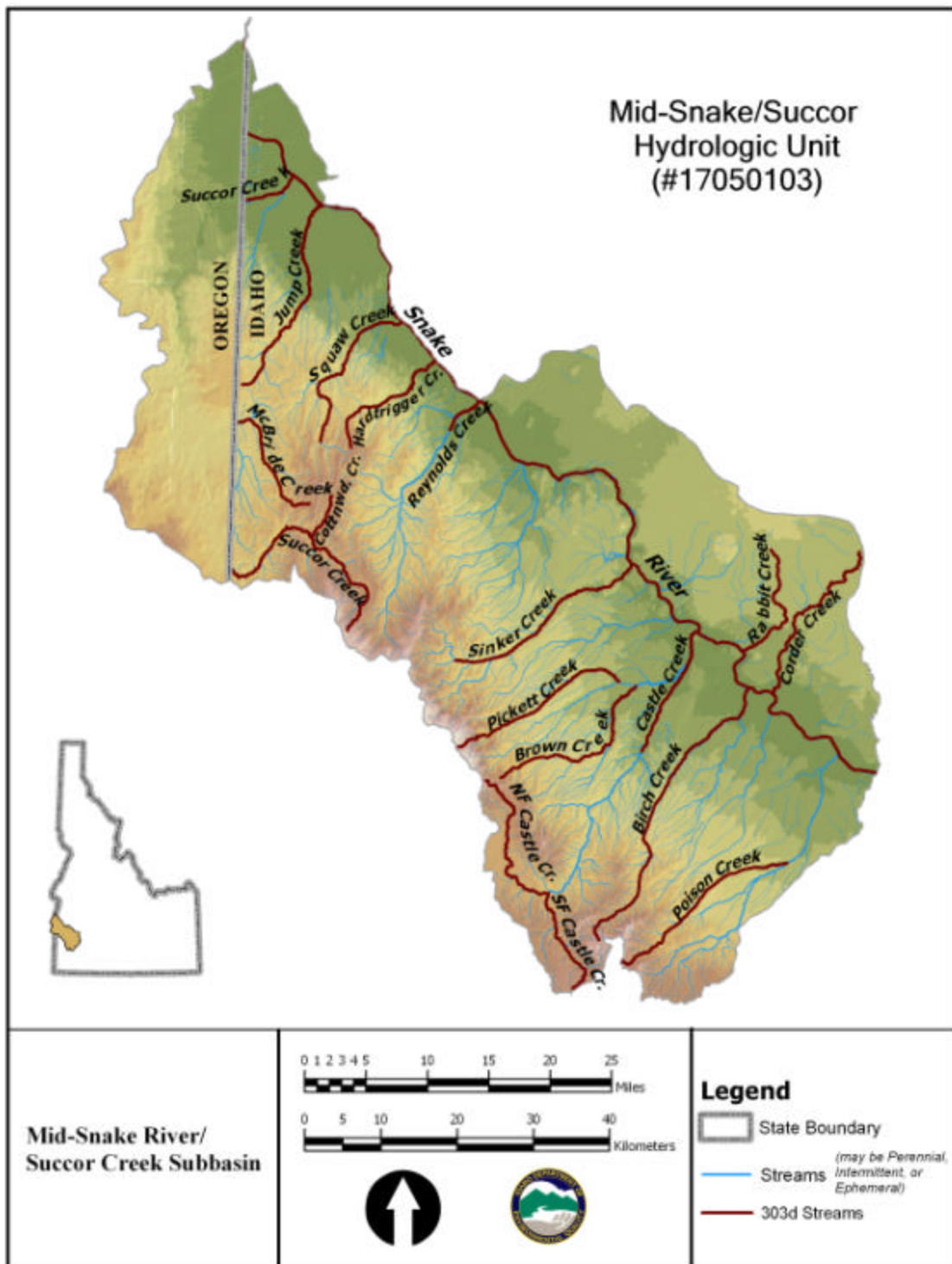


Figure A. Mid-Snake River/Succor Creek Subbasin

Key Findings

The Mid Snake River/Succor Creek watershed is an arid watershed characterized by hot summer temperatures. Tributaries are generally low volume rangeland streams that have a combination of high ambient temperatures, geography, poor shading, low flow volume, flow alteration, and naturally warm springs, which often leads to exceedances of the temperature standard. Even with maximum potential shade, some of the streams in the watershed cannot meet the cold water temperature standard. These streams were evaluated to determine the best achievable temperature based on the maximum potential shade.

Nutrient loading to the Snake River comes from the upstream segment of the Snake River, drains, tributaries, and point sources. The primary nutrient impairing beneficial uses is phosphorus. A total phosphorus target of 0.07 mg/L has been set for the Mid Snake River, based upon the work done in the draft Snake River Hells Canyon (SR-HC) TMDL (DEQ 2001). The critical period for target application is May-September.

Instream channel erosion is the primary source of sediment loading in Castle Creek, Sinker Creek, and Succor Creek. Land management practices contribute to unstable banks and this resultant instability leads to sediment delivery to the stream channel. Eighty-percent bank stability was selected as a surrogate target to achieve 28% depth fines in the creek.

Table B summarizes the outcomes of the subbasin assessment and TMDL. Table C shows the specific stream segments for which TMDLs were set.

Table B. Summary of subbasin assessment and TMDL outcomes.

Water Body	Boundary	Listed Pollutants	Proposed Action
Snake River WQLS: 2670 AU: 006_07	CJ Strike Reservoir (below dam) to Castle Creek	Sediment	De-list sediment List TDG
Snake River WQLS: 2669 AU: 006_07	Castle Creek to Swan Falls	Sediment	De-list sediment
Snake River WQLS: 2668 AU: 006_07, 001_07	Swan Falls to Boise River	Bacteria, dissolved oxygen, nutrients, sediment, pH, flow alteration	De-list bacteria, sediment, pH TMDL for nutrients Dissolved oxygen will be addressed by the nutrient TMDL No action for flow alteration List temperature

Water Body	Boundary	Listed Pollutants	Proposed Action
Birch Creek WQLS: 2684 AU: 021_02, 03, 04	Headwaters to Snake River	Sediment	De-list sediment
Brown Creek WQLS: 2682 AU: 019_02, 03, 04	Headwaters to Catherine Creek	Sediment, Temperature	De-list sediment, temperature
Castle Creek WQLS: 2680 AU: 014_03, 04, 05	T5SR1ES28 to Snake River	Temperature, sediment, flow alteration	TMDL for sediment, Delay TMDL for temperature to collect additional data No action for flow alteration
Corder Creek WQLS: 2685 AU: 025_02	Headwaters to Snake River	Sediment	De-list sediment
Cottonwood Creek WQLS: none AU: 003_02	Headwaters to Succor Creek	Temperature	De-list temperature
Hardtrigger Creek WQLS: 2675 AU: 008_02	Headwaters to Snake River	Sediment	De-list sediment
Jump Creek WQLS: 2673 AU: 005_02,03	Headwaters to Snake River	Habitat Alteration	TMDL for sediment No action for habitat alteration
McBride Creek WQLS: 2672 AU: 004_02,03	Headwaters to Oregon Line	Temperature, sediment, flow alteration	De-list temperature, sediment No action for flow alteration
North Fork Castle Creek WQLS: 2680 AU: 014_02a	Headwaters to Castle Creek	Temperature	Delay TMDL for temperature to collect additional data
Pickett Creek WQLS: 2681 AU: 016_02, 03	T5SR1WS32 to Catherine Creek	Sediment	De-list sediment

Water Body	Boundary	Listed Pollutants	Proposed Action
Pickett Creek WQLS: 6681 AU: 016_02	Headwaters to T5SR1WS32	Temperature, sediment, flow alteration	De-list temperature, sediment No action for flow alteration
Poison Creek WQLS: 2687 AU: 006_02, 03	Headwaters to Shoofly Creek	Not Listed, See Chapter 1	No Action
Rabbit Creek WQLS: 2677 AU: 026_02	Headwaters to Snake River	Sediment	De-list sediment
Reynolds Creek WQLS: 2676 AU: 009_04	Diversion to Snake River	Sediment	De-list sediment
Sinker Creek WQLS: 2679 AU: 006_03	Diamond Creek to Snake River	Temperature, sediment, flow alteration	TMDL for temperature, sediment No action for flow alteration
South Fork Castle Creek WQLS: 2683 AU: 014_02	Headwaters to Castle Creek	Bacteria	Delay bacteria TMDL to collect additional data
Squaw Creek WQLS: 2674 AU: 007_02, 03	HW to Snake River	Temperature	De-list temperature
Squaw Creek WQLS: 2674 AU: 007_03	Unnamed tributary 3.9 km upstream to Snake River	Sediment	De-list sediment
Succor Creek WQLS: 2671 AU: 002_04	Oregon line to Snake River	Sediment, flow alteration	TMDL for sediment, bacteria No action for flow alteration
Succor Creek WQLS: 6671 AU: 002_02, 03	Headwaters to Oregon line	Temperature, sediment	TMDL for sediment Delay TMDL for temperature to collect additional data

Table C. Streams and pollutants for which TMDLs¹ were developed.

Stream	Pollutants
Snake River (Swan Falls to Oregon Line)	Nutrients, Dissolved Oxygen (as part of nutrient TMDL)
Castle Creek	Sediment
Jump Creek (Mule Creek to Snake River)	Sediment
Sinker Creek	Sediment, Temperature
Succor Creek (Headwaters to Oregon line)	Sediment, Temperature
Succor Creek (Oregon line to Snake River)	Sediment, Bacteria

¹Total Maximum Daily Loads